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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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Adam E. Norton

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01/20/2006

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EXAMINER

CHANG, AUDREY Y

ART UNIT

PAPER NUMBER

2872

DATE MAILED: 01/20/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/081,078

Applicant(s)

NORTON, ADAM E.

Examiner

Audrey Y. Chang

Art Unit

2872

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 01 December 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 27-30,33-36 and 39-51 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 29,30,39-42 and 50 is/are allowed.
- 6) ☒ Claim(s) 27-28,33-36, 43-48 and 51 is/are rejected.
- 7) ☒ Claim(s) 49 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- ☐ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other: _____

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on **December 1, 2005** has been entered.
2. This Office Action is also in response to applicant's amendment filed on November 10, 2005, which has been entered into the file.
3. By this amendment, the applicant has amended claims 27-30, 39-50, has canceled claims 37-38 and has newly added claim 51.
4. Claims 27-30, 33-36, and 39-51 remain pending in this application.
5. The rejection to claims 27-30, 43, 44 and 47-50 under 35 USC 112, first paragraph, with regard to newly added subject matters as set forth in the previous Office Action are withdrawn in response to applicant's amendment.

Response to Amendment

6. The amendment filed **November 11, 2005** is objected to under 35 U.S.C. 132(a) because it introduces new matter into the disclosure. 35 U.S.C. 132(a) states that no amendment shall introduce new matter into the disclosure of the invention. The added material which is not supported by the original disclosure is as follows: the newly added claim 51 recites a depolarizer having three birefringent plates each having different thickness and polarization axis. The specification only gives support for the three plates to have different thickness in the ratios either of 4:3:9 or 1:3:9, but **fails** to give support for the plates to have any different thickness to make them a depolarizer.

Applicant is required to cancel the new matter in the reply to this Office Action.

Claim Rejections - 35 USC § 112

7. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

8. **Claim 51** is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

The reasons for rejection based on the newly added matters are set forth in the paragraph above.

9. **Claims 44 and 51 are rejected under 35 U.S.C. 112, first paragraph**, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

The specification and the claims fail to teach that a depolarizer can be formed by simply having three birefringent plates having different thickness (it means any different thickness) or by simply having the total thickness of the three birefringent plate to be of 6 mm. The specification only give support and disclosure for the three birefringent plates of identical birefringent properties to have thickness in either the ratio of 4:3:9 or 1:3:9. The specification **fails** to teach by having a total thickness of 6 mm or having any other different thickness will result depolarization effect.

Claim Rejections - 35 USC § 103

10. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

11. **Claims 27-28, 33-36, 43-48, and 51 are rejected under 35 U.S.C. 103(a) as being unpatentable over the patent issued to Hakimi in view of the Optics (Hecht and Zajac, pages 246-249).**

Hakimi teaches a *depolarizer* that is formed by having a *plurality of at least three contiguous linear birefringent elements* arranged in successions, (please see Figure 1, column 4, lines 49-50).

Hakimi teaches that the birefringent plates can be made of *quartz crystal* with crystal axes oriented in specific relationships, which means the birefringent plates are of identical birefringent properties.

Hakimi also teaches specifically that in order to destroy the phase coherence of an input optical radiation, (i.e. to provide depolarization effect to the input optical radiation), the length or *thickness of each of the birefringent elements* has to be selected so that the polarization mode or phase delays in the birefringent element exceeds the coherent time of the light, (please see column 3, lines 38-52).

This reference however does not teach explicitly that the thickness of the birefringent plates have the explicit thickness ratios as claimed in the claims. With regard to claims 43 and 44, Hakimi also fails to explicitly teach with specific reference to claim 43, the respective thicknesses of the plates are 1.5 mm, 1.125 mm, and 3.375 mm; (which stands for a ratio of 4:3:9) and with specific reference to claim 44, where the total thicknesses of the plates is approximately 6 mm. However as explicitly taught by **Hecht and Zajac** the polarization phase delay for a birefringent crystal is defined by $(2\pi/\lambda)*d(|n_o-n_e|)$, wherein n_o is the refractive index for the ordinary ray and the n_e is the refractive index for the extraordinary ray

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propagating in the crystal, and “d” being the thickness of the crystal, this means the polarization phase delay is closely determined by the *thickness* of the crystal. It would then have been obvious to one skilled in the art to modify the thickness of the plates to have the thickness ratios to make the plates have the criterion to destroy the phase coherence of the input optical radiation to provide the optimized depolarization effect. It is also true that since the thickness of the plate determines the polarization phase delay of each plate, the depolarizer of Hakimi having the three birefringent plates must have a thickness satisfies the ratio, (if the ratio is the critical factor for achieving depolarization function) in order for the plates to provide depolarization function.

Claims 27, 28, 43, and 43 have been amended to include the feature that each of the birefringent plate has a polarization axis and each birefringent plate having a substantially different rotation angle of the respective polarization axis. Hakimi teaches explicitly that each of the birefringent plate has a polarization axis and the criterion for depolarization effect to take place is to have the rotation angle of the polarization axes between the two adjacent plates to be different, (please see column 4, lines 30-35). Although it does not teach that the rotation angles of all three polarization axes are different from each other such feature can easily be modified and satisfied while ensuring the adjacent plates to have different rotational angle of 45 degrees as explicitly taught by Hakimi.

With regard to claims 33 & 34, it is asserted that the relative thicknesses taught by **Hakimi** further are such that at least one retardance frequency would vanish in a first quadrant.

With regard to claim 35, **Hakimi** explicitly teaches where the thicknesses of the three plates are selected such that the plate of intermediate thickness is positioned between the two remaining plates. *See* Fig. 1.

With regard to claim 36, the teachings set out in the **Hakimi** reference implicitly, if not explicitly, encompass an arrangement of said three plates where the thicknesses of the three plates are

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selected such that the plate of least thickness is positioned between the remaining two plates, (please see Figure 1).

Allowable Subject Matter

12. Claims 29-30, 39-42 and 50 are allowed.

13. The following is a statement of reasons for the indication of allowable subject matter: of the prior art references considered none has disclosed a depolarizer that is comprised of three birefringent plates of the *same* birefringent materials having thickness ration of either 1:3:9 or 4:3:9 and such that the first

angle between polarization axes of a first adjacent pair of the plates is substantially $\left(n + \frac{1}{2}\right)\frac{\pi}{2}$, and a second angle between polarization axes of a second adjacent pair of the plates is substantially

$n\frac{\pi}{2} \pm \arccos(-1/3)/4$, where n is an integer.

Double Patenting

14. A rejection based on double patenting of the "same invention" type finds its support in the language of 35 U.S.C. 101 which states that "whoever invents or discovers any new and useful process ... may obtain a patent therefor ..." (Emphasis added). Thus, the term "same invention," in this context, means an invention drawn to identical subject matter. See *Miller v. Eagle Mfg. Co.*, 151 U.S. 186 (1894); *In re Ockert*, 245 F.2d 467, 114 USPQ 330 (CCPA 1957); and *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970).

A statutory type (35 U.S.C. 101) double patenting rejection can be overcome by canceling or amending the conflicting claims so they are no longer coextensive in scope. The filing of a terminal disclaimer cannot overcome a double patenting rejection based upon 35 U.S.C. 101.

15. Claim 49 is objected to under 37 CFR 1.75 as being a substantial duplicate of claim 40. When two claims in an application are duplicates or else are so close in content that they both cover the same

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thing, despite a slight difference in wording, it is proper after allowing one claim to object to the other as being a substantial duplicate of the allowed claim. See MPEP § 706.03(k).

Response to Arguments

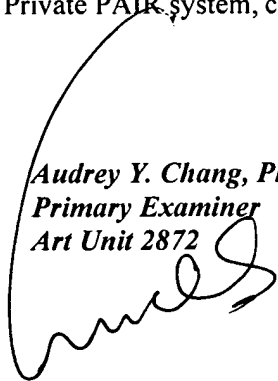
16. Applicant's arguments filed on December 1, 2005 have been fully considered but they are not persuasive. The newly amended and added claims have been fully considered and they are rejected for the reasons stated above.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Audrey Y. Chang whose telephone number is 571-272-2309. The examiner can normally be reached on Monday-Friday (8:00-4:30), alternative Mondays off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Drew Dunn can be reached on 571-272-2312. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

***Audrey Y. Chang, Ph.D.
Primary Examiner
Art Unit 2872***



A. Chang, Ph.D.